

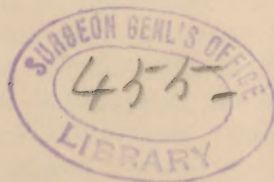
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OVER-STRAIN AND UNDER-POWER
OF BRAIN.

By C. H. HUGHES, M. D., ✓

ST. LOUIS, MO.



Over-strain and Under-power of Brain.*

*A CURSORY SURVEY FOR LAY READERS ESPECIALLY, OF
THE INTER-RELATION OF PSYCHICAL DEMAND
AND PHYSICAL SUPPLY.*

By C. H. HUGHES, M. D., St. Louis, Mo.

IN the days of our ancestors when our grandfathers, and perhaps even the fathers of some of us, obtained their education mainly during the invigorating days of winter, when the season was unpropitious for the plough, and their school-houses were built of materials which their own hard hands had hewn from the forest, over mental strain from too much study was but a mythical possibility, and under-power was one of those fabulous gods of the imagination for which their incredulous heads and hands provided no Pantheon. Their organisms were hardened and strengthened to their surroundings by ample sunlight and fresh air, pure, plain food (well relished), timely and undepressing recreation, and ample rest after each day's work for mind and body.

Luxury did not lurk in the backless seats of the average district log school-house of those early days, with its wide open fireplace and its walls chinked with mud, which mischievous boys often picked out to further ventilate the school-room.

From these primitive school-houses the scholar often went home hungry, for he not only studied his books but helped to cut the wood and make the fire that kept him warm, and to sweep the school-room, but he seldom went home with the headache of a vitiated atmosphere or the pangs of a nervous dyspepsia.

Our fathers were men of power. Our mothers too

* This essay on mental hygiene is in substance the author's lecture before the Alumni of Mary Institute, St. Louis. It is here presented as a cursory summary of facts for the government of brain-rest, repair and action, which have their warrant in the facts of science—physiological, psychical and physical—so written as to be read with appreciation, it is hoped, by a not insignificant number of readers of the *ALIENIST* who are engaged in the exalted vocation of education—the highest calling, properly pursued, in a civilized nation.

were like them; at least the mothers and fathers of those of us who have survived to maturity with reasonably good constitutions, the ordeals of school and social life in our large cities.

Like their brawny arms were our fathers' brains. They rejoiced in surplus of power. Over brain-strain from over-study was to them a stranger and a myth.

Conscious of strength which had never been overtaxed, they had but to dare in order to do, and they had that pluck to undertake great enterprises which comes of conscious power. They realized no finite impossibilities to mind.

The *ennui* of sedentary vocations and constant in-door occupations seldom troubled them.

Compelled to be physically more reliant than the men of our time, and living of necessity more in accordance with the just demands of nature, they bequeathed to their children plucky maxims in regard to the capabilities of mind, beyond our power of successful execution under our changed environment.

To them all things were possible to mind, because they had not realized, as many of their descendants have, how feeble the mental powers are, without a strong brain and body to support them. *Mens sana in corpore sano* had no such realistic meaning to our fathers as has been forced upon us. True, the possibilities of the human mind are as yet immeasurable and may reach, for all we know to the contrary, to the very mind of the Infinite; but these possibilities are only possible to us through a more circumspect and less prodigal use of all our powers than our ancestors displayed. We must save ourselves for our brains, and save our brains for our mind's sake.

The morning newspaper did not come each day to our fathers before they sat down to breakfast, to make its early demand upon the organic neural force and abstract power which, in some organisms, should all go to the stomach at that time of day.

Our fathers went to bed with the set of sun, or, if the dim tallow-dip or fagot-light prolonged their hours of vigilance, no brilliant gas or dazzling electric light could then, as now, make sleep a stranger to their eyes till the return of the next morning's sun, or if, perchance, they fell asleep, as indeed they scarce could help, even with the weightiest matters of their day on their minds, under the unstimulating household lights of their times, no telephone aroused them from their peaceful slumbers and no dreams of Wall Street ventures (of bulls or bears or fluctuating stocks of any kind) startled them into premature unrest before the break of day. The terrors of Wall Street insomnia haunted not their tranquil sleep, nor did the "ticker" and the phonograph combine to wear them out by day.

The news of the whole world did not come to them as it comes to us now in a single day, to keep their brain-cells in ceaseless activity, only to end in sudden stoppage of the heart through an inadequately-rested, constantly overtaxed and finally paralyzed nervous mechanism, failing first in cortex or base of brain; or a weakened and broken brain-vessel or blood-clot detached from the walls of a feeble, enervated heart, and lodging in the brain so as to stop as quickly as the click of a heart-valve the machinery of thought and motion, just as a particle of dirt within its machinery stops the movements of our watches. Railroads did not rob time of its diurnal periods of rest in their day, the crossing of the Atlantic within a week or circuit of the world in a few months were not possibilities of their time.

Our fathers did not sleep on the go and go in their sleep as we do. The typical fifteen minutes for refreshments was unknown to them, and at home they took time to rest in going to and from their meals and places of business, because they went in their own conveyances or on foot instead of the cable or elevated rail car or the steam coach, and they were not striving after an electric motor to jostle their digestions and help them to go

faster through the world. In short, environments then imposed conditions of rest from too constant brain-strain, which were in accord with the demands of nature; they ate and slept and rested like their horses; eating temperately of plain food in the daytime, and retiring physically wearied by honest toil at night.

Our fathers lacked, and they did not require, the wisdom of self-care, that we must have in order to survive, if duty's demands in our time are answered.

With all the added stimulants to over-mental activity about us, which did not press upon our fathers, it is a possibility and a certainty (unless we are wiser than they were) for us to run our race much more swiftly and perish sooner than they could have done under the mental pressure of their time. Their environments conserved their powers, ours tend to destroy. The necessities of existence imposed upon them more personal physical effort. They did largely a divided mental and physical work, and they could not if they would, so readily run all night and scarcely note the fleeting hours as we can. We have reached a time when, in view of the many influences about us tending to accelerate our mental movements, it seems far less figuratively than heretofore, to be but a step from the cradle to the grave. Most of us are willing and are probably anxious to go to heaven when we die, but most of us, I think, want to keep out of the grave as long as we can.

Over-pressure is the power which bears us there. How may we have the power to resist this pressure to the farthest natural extent? The problem of life is in this question, and the problem of health upon which depends the power of body and mind is involved in it likewise.

Health depends upon organic power and organic power depends on health. The wider and deeper the view we take, the farther and clearer we see that the question of over mental pressure is a relative one to organic power. It is a question of the relation of mind to organism and

its environment, and upon its correct solution in the light of all that we have learned or may yet know of the functions and laws of mind and its subservient or governing organism, the brain, allied nervous system and whole physical body, will depend our capacity to so care for the mind, under all the pressure it may be called upon to sustain, that it may not fail through under-sustaining power. For whatever may be the real nature of mind, which thus far no eye has seen or glass has reached, it is so intimately allied to organism as to be practically inseparable from it in life. A blow upon the head may derange its manifestations for life, a subtle poison like alcohol or opium or hashish introduced into the blood which circulates through the brain may temporarily change or permanently destroy the mind's identity.

An inhalation, as of protoxide of nitrogen, amyl-nitrite or ozone, ether, chloroform or carbon-dioxide may exalt, depress, pervert, or suspend the mind's functions. An obstructed vessel, a tumor's pressure or a blow on one part of the brain, may suspend the memory of facts or of words, or of time or power of speech alone, without loss of words, or arrest, alter or destroy the perceptive powers, without always deranging the reasoning faculties or destroy or cripple special or general power of motion, leaving the intellect *intact*.

Ferrier, the great neurophysiologist, of England, with insulated electric needle placed, now on one convolution and now on another, of a monkey's brain and causing the monkey to make, at his master's bidding, chattering noise or execute prehensile, walking, climbing or other movements of the muscles of the body; touching certain centers of the brain surface and making the monkey's face to express surprise or fear and other varieties of facial expression of mental states, together with the physiologically demonstrated selective affinities of certain drugs for special parts of the brain and spinal cord, illustrates what science has done to s w

how wonderfully like a marvelous machine of man's making the mental machinery is, and the same experiments show that this finely-adjusted mechanism, more delicate apparently than that of the most perfect and complex mechanisms of Geneva or Elgin by which we time our heart-beats and count the fast-falling footsteps through the little span of time allowed us for our life-work here, is far more difficult to derange than any mechanism of man's contrivance that ever approaches it ever so distantly in delicacy and complexity and perfection of movement. The nature of the human organism in its finest parts is hardy and adapted to endurance, capable of withstanding great abuse and violence from without and self-inflicted damage from within, and of repairing great injuries if allowed a reasonable chance. Its power of self-repair, which we call recuperation, or the act of recovering lost power or the *vis medicatrix natureæ* of Medicine distinguishes it markedly from all mechanisms of man's making. But, like the machinery of human workmanship, it is best repaired at rest. If given the same attention to its physical needs as the engineer gives to the proper working condition of the machinery that carries us fifty miles an hour through space, it would work with equal accuracy through its allotted period of time and carry us less suddenly than both now do, into eternity.

We live in a social and business atmosphere of excitement, and our physical environments are rather stimulating than restorative.

We make provision for action, always action, in our social, political and educational organizations, and reform and progress and never rest are our constant watchwords; and yet our frame is so constituted that adequate rest is one of its chief organic needs and essential preliminaries to progress. "Tired nature's sweet restorer, balmy sleep," is not courted as she ought to be. "Sleep! balm of hurt minds! nature's second course! sore labor's bath! Sleep, that knits up the raveled sleeve of care" and

compensates the waste and wear and worry of our mental life, is too much ignored in all of our arrangements for work of mind. Our amusements and recreations too, are mainly provided for during hours which were best devoted to rest and sleep.

To us the night cometh not now, as in the ancient days, when no man can work; night with us, when the brain ought to be at rest, has become the chief time of action. At that part of the day when the heart-throbs should be lessened and the over-taxed organ allowed a little repose between its beats, its pulsations are accelerated to meet the imperative calls for blood, of an unresting and unrestful brain whose ideational cells and percipient centers, are kept in ceaseless activity by the demands of late school work, midnight committee meetings of merchants, manufacturers, manipulators of markets and managers of "the machine" of party politics. To these we add the neural prod and whip and spur of artificial alcoholic (and even tea and coffee) stimulation at the wrong time of day, when an inclination to repose and not over-action of the nervous system and mind should be encouraged.

The man or woman who, in this age of demand for action, sleeps and feeds inadequately and works on, is destined to break down or die prematurely; and if the demand of tired nature for repose and repair be unwisely and cruelly answered, as, alas, it too often is in our time! by the goad of artificial stimulation, the end comes suddenly in those startling brain breaks which now too often abruptly sadden hearths and homes that might have had happiness for years had wiser self-management prevailed in the household head and beyond the homestead; but in this great world of action the light of great actors on the world's stage goes out as suddenly as a shut-off gas jet. Great mental suns are eclipsed in the twinkling of an eye, and while it ought yet to be day to them, from neglect of such precautions and care of self as the Humane Society exacts for our horses.

Within a few short years the land has been draped in mourning for an ex-president and greatest general of the age, dead from over mental strain, because he knew not how to rest his brain at a time of life when nature demanded more repose than he gave it. It is said that he died of cancer, but before the cancer was the shock of Wall Street and its financial disgrace and irreparable reverse of fortune, just as before the cancer that killed Napoleon at St. Helena was Josephine divorced, Europe lost! over which the star of his brilliant, restless, wicked destiny, had but lately shone as if it might never set in the dark and overbearing retrospective anguish of his exile.

The nation scarcely gets over its mourning for a great general whose name during the late war was as familiar as the Potomac, dead too soon for lack of rest, and another who in his life was as brave as the bravest of Gettysburg and who will be remembered till the history of Southern reconstruction shall be forgotten, whose physique gave promise of a longer lease of life, before another brave military chieftain prematurely falls and a vice-president drops dead suddenly, because his heart nerves descending from the head and upper part of the spinal cord were deprived by ceaseless activity of that power which comes from adequate rest, to keep the heart going. He heeded not the warning of a previous brain-failure which demanded judicious rest as the condition of subsequent moderate integrity of function.

The life of a late actor of great promise and power goes out in mental fatuity and general paralysis from self-preventible causes, associated with physical unrest. Another swoons, but not in play upon the stage, of heart-failure, beginning in his head. And I might name here another who might yet have charmed the world for a quarter of a century with his inimitable personations, whose doom is sealed by alcoholic over-pressure added to the sustainable strain of his avocation.

The ruin of the histrionic profession is in the unrest and vicious indulgences that additionally exhaust the brain

of its members in the intervals between the plays, when nature cries for rest and recuperation of power. And I may add, this is the chief sin and reproach which attaches to the modern legitimate drama, as it is called.

One of the greatest financiers of the present day drops dead of heart-failure, due to over brain and nerve-strain, during a business conversation. Killed by his own hand, snapped out by his own imprudence at a time of life when his father had only begun some of his most successful financial manipulations in the monetary world. He had not a constitution hardened to mental endurance like that which the rigid environments of his father's youth had made for him.

Another scion of a greater ancestor, inheriting millions of money and the presidency of a great trunk line, now lies mentally prostrate, at a time of life when the father, like the great Vanderbilt, was just in the zenith of his power.

Two prominent and powerful pulpits of our city were but lately draped in mourning and congregations grieving and would not be comforted because of loved ones taken from them by a sudden apoplexia; and these two dire calamities might, by timely and judicious rest of their sad victims have been averted.

The lesson of those sudden break-downs is obvious. They are nature's violent penalties—her capital punishments for over brain pressure and neglected rest. If epitaphs always gave the causes of death those upon the tombstones of most of our great men of the present age would read something like this:

"Dead because of resisted or neglected sleep."

"He stimulated when he ought to have slept."

"He fell prematurely because he never rested when he could help it."

"While he lived he was always wide awake."

"He never waited for the next train."

"He was ever on the go, and now he's gone before his time."

"He was always in a hurry and went away too soon."

"He was a hustler in his day, and went away early."

"His sun set while it was yet day."

"Ambition broke him in his prime."

Not indeed that all use alcoholic stimulants, but by all the excitants of brain action man can devise, his poor brain breaks down when it ought to be in the very prime of power. There seems to be a sort of morbid pride, like the suicidal manias which sometimes sweep over the land, displaying itself in the wish of some of our best and hard-to-be-spared men, "to die in harness," like an over-driven horse. But what sense, to sensible people, is there in this foolish idea?

How much better to work longer, if a little slower, as in the course of nature we approach the grave, and finish up our work here without startling *denouement*, and more leisurely wrap the drapery of our couch about us and calmly die like one who lies tranquilly down to pleasant dreams.

Overwork over-strains and weakens the nervous mechanism which holds intact the circulation of the brain; the vasomotor system of nerves, as it is called, is more or less paralyzed, and congestion and abnormally quickened circulation of the brain results in insomnia with insanity and paralyzes as consequences, especially the general paralysis of the insane, or paresis. Alcoholic stimulants act in a similar manner; or brittle changes, by earthy depositions in the strong elastic coats of the arteries, technically called atheromatous degeneration, take place in the vessels of the brain, with advancing age, as was probably the case of the late John B. Gough, whose impassioned oratorical climaxes and dramatic manner put upon the blood-vessels of his brain the extremest possible tension. He was too old for that style of oratory. Heart-failures (so-called) of our great men of large affairs are generally head-failures from over-pressure and under-power, the latter from lack of adequate daily recuperation, just as their dyspepsias are. How can heart or stomach prosper in such organisms when their cormorant brains, continually

demanding more nerve force and never resting, constantly rob these lower organs so intimately associated by nervous connections and dependent upon the brain for force?

Ceaseless mental activity after a time overtaxes the cerebro-spinal axis and sympathetic nervous system, the centers of power for intellection and for the propulsions of organic life. The gastric juice that dissolves the food taken into the stomach is diminished through defective nerve influence, in quality and quantity, and a slow or difficult digestion goes on in the stomach, though its source is in the head. Hogs never have dyspepsia and you may load the tranquil-minded laborer, who works willingly with his hands all day long, to the full and he will labor with his load, be it ever so large, to a successful completion of digestion. Dyspepsia is the badge of the brain-wearied and over-worn by the over-pressure of work or vigils hard to be borne and of the comparatively unrested.

The pneumogastric nerves and their sympathetic connections sustain the functions of heart and stomach, and in part, that of the lungs and liver, and when these lower organs begin to fail in brain-workers, nature is protesting, just as she does in the neuralgias, headaches, and slight disorders of sensation and motion which are the oft precursors of brain break-down. It is then time for the prudent to take warning and begin the work of restful repair. Let us care for our bodies as we would care for our houses and not live long in them with leaking roofs and cracked foundations, foul drains and damaged food supplies. No system of education or scheme of brain work is safe for the organism, that fails to provide for adequate recuperative rest; and successful schools should look to the manner in which recreation seasons are spent by pupils and see that the proper times of repose are not partly spent in exhausting activities that give under-power in lieu of physical restoration. We are too much and too long on our feet or in our chairs, and too little on our backs or recumbent; the upright

position taxes the heart more than the recumbent. The heart is an accommodating and responsive organ; it beats fast or slow within certain limits according to the demand made upon it for blood by the brain. Ordinarily it beats seventy-two times to the minute when we are sitting in mental repose. If we get up and walk about or run, or if something greatly agitates our minds, its beats increase to eighty, ninety or more (rarely in a healthy person), to a hundred and twenty, which is ordinarily a fever pulse. Alcoholic stimulants have the same effect.

Eight hours out of every twenty-four should be devoted to recumbent repose, woman for obvious reasons requiring a little more than man, seven and a half to sleep and half of each day to rest, relaxation and recreation, sleep and meals; and sleep and rest should be mainly in the night-time, while the remaining twelve hours could then be given mainly to vigorous mental or physical work, which is more than the average work, mental or physical, which man now gets out of his organism under the present irregular, exacting and artificially stimulating methods. We have largely turned night into day and come to despise, because we are too sleepy to enjoy the early morning sun and the vigor in his rays. Some of us never see the novel sight of a sunrise, except during our vacations, when we get up late and we are shaken up earlier than is our wont. (I mention the shortcomings of our sex because gallantry forbids special reference to yours, but since Eve first misled Adam in paradise the hygienic as well as moral *faux pas* of the sexes have been about equal and mutual.)

You may point your own moral from our shortcomings and make your own application.

We shall not have lived in vain if we have served or shall serve as a warning to the gentler sex to beware of over-pressure and the causes that lead to under-power, to sustain the strain of life's mental and physical burdens. I do not say that we should in our habits of life go back to the back log and log cabin of our fathers or to the

spindle and distaff of our mothers. We could not do so if we would, for we have passed beyond that in the onward revolution of human progress, but I would bring back to our homes and habits of life, the health-giving influences and surroundings of those days, the quiet evenings, the early-to-bed and early-to-rise habits of the past, and substitute the eventide meditations and mental repose at night-time of the quieter past for the excitations which gas-lights and electric illuminators, telephones and palace sleeping cars make possible at the present time. Physically, at least, we live more uprightly than our fathers and mothers did, that is, we stay up later and longer every day. We are living upon the capital, physical and moral, which they have bequeathed to us. Are we adding anything to our inheritance? Others are to receive from us, or have received from us, as we have inherited from those who have preceded ourselves, to fight the battle of life and sustain its physical and moral duties. We are not yet permanently degenerated, we are simply over-pressed and over-strained, not beyond our possible capacity, but above our powers, unconserved. We have a lesson to learn which our ancestors did not have to study, because no such demands were on them as are on us—the lesson of how to provide for the highest possible degree of human endurance, and, notwithstanding, many shall fall by the wayside and in the battle's front from lack of the requisite knowledge timely gained, which is power to endure, we shall, as a race, learn and profit by the lesson, and the fittest will survive. We have not yet reached the beginning of the end of our career.

The glories of a brilliant future of unsurpassed grandeur in great and glorious achievements, opens on our view and awaits only the judicious training of our powers, and the conservation of our developing energies, before we and our children may take possession. The human organism is pliant and buoyant, and while unlike any other machine, it may set in motion forces of its own which can destroy it, it also, unlike all other machinery,

has a singular power of self-repair. We need take no pessimistic view of our mental future if we study how the organism conserves itself, and give it a fair chance while demanding the paying-out of its powers in education.

With all the strain which an advancing civilization imposes on our minds and bodies we have been enabled, through the improved methods of protection from the effects of physical exposure and the spread of epidemic diseases, to so nurse what is left of our physical heritage as to prolong the average duration of human life. The same progress made in the direction of developing organic power in the growing period of life, will save and prepare our children for deeds of mental endurance far beyond our own strength. This knowledge is indeed the highest kind of power, and this power is knowledge. Let the pride of our young men and women be in their strength of body and brain, to sustain the display of mental power in purity and beauty. This is the true moral æsthetics. The courage to successfully prosecute high ideals of mind and heart is sustained and assured by organic endurance and power. While it is possible for the machinery of the adult mind to work well twelve hours out of every twenty-four this amount of work is over-pressure to the average mental organism now, with the generally uninvigorating, if not positively depressing manner in which, at least, a part of the remaining hours are usually spent by brain-workers. This amount of work is not habitually possible under the drawbacks of improper food, dyspepsia, bad ventilation disregarded, late hours, the midnight club, the morning german, night stimulation and study, the dissipations generally of both moral and immoral living, unsuitable clothing and insufficiently sunned bodies. We should sun and air our bodies as we do our bed-clothing and bed-chambers. Human bodies and brains, like plants, need good soil, sunlight and fresh air, and a time of rest for perfect development and power. If we turn from ourselves to our children the factor of growth in them is to be considered

in addition. They are in the most active period of physical and mental life. Power for daily expenditure to supply the demands of education must be secured to them from their environments, and power to become in them latent in brain and bone and muscle, and every vital organ, for future expenditure, must be drawn from the soil about them, which is the air they breathe, the food they eat, the clothing they wear, the houses they live and rest in and the sun that shines upon them, the recreation they receive and the moral atmosphere that surrounds them. The pressure the matured organism sustains with impunity is over-pressure in the young, and if borne at all it will be sustained at the expense of development and a stunted and pigmy immaturity, which will bear the marks of over-pressure and under-power for life's demands to a premature grave. There is a transition period, too, from childhood to youth when the pressure of study should be especially light or taken off altogether. A long vacation from all over-straining study about the period of puberty is not lost in either boys or girls, but well repaid, in the end, in a physique that fits for the sustenance of far greater physical and mental strain, than if the unremitting pressure of school-life had been endured at this period. My own opinion is that to not letting up of school-pressure for a while at this period more than any other one thing besides, is due the lessened stature and physique of our graduates from the great academies compared with their parents generally. The gale that the sturdy oak in its prime withstands, and that breaks the old tree in its decadence, bends down and dwarfs or uproots the sapling. We should be careful not to bend too violently or too often the growing tree, lest we should interfere irreparably with its fullest development. It is fortunate for the human race that the young school sapling has been so well endowed by nature for resisting over-pressure, even at the expense of developing stature. Had it been otherwise, the human race, under the inconsiderate goading processes of modern educational methods, which have largely ignored the child's organism,

and the manner in which it has been cared for both in and out of school, would have much more enfeebled it than it is now. Education has tended to draw out about all the reserved vitality that nature could supply the growing organisms of our children, leaving little surplus for exuberant physical growth.

Education should develop the organism. A student should quit school stronger in capacity for bodily as well as mental endurance than when he or she matriculated. This means a developed mind with power to sustain its severest demands. I do not mean that a student should have the muscles of an athlete or the agile powers of a gymnast, but the frame and physical powers should not be so deteriorated after the completion of an educational curriculum as to make physical expansion under circumstances demanding it, an impossibility. Muscular power should exist in kind if not in quantity. Responsive capacity to developing influences should not be destroyed in the organism by over mental pressure. True education of brain should develop both the motor and the psychical areas of the brain—the places where the power that governs and excites the physical movements of the body as well as the centers where the faculties of the mind and soul dwell and work.

The sanitary condition of our great cities, the healthfulness of the streets, in respect of sunlight and pure air our children play in, is of equal importance with the sanitation of the school-room, for if they cannot have the parks and fields for play-grounds they should play and romp in the streets.

It should be remembered, that whereas our remoter ancestors were largely an out-door people we are greatly an in-door people; even when we go abroad, from city to city, or State to State, or from our homes, on business or pleasure on the street or railroad cars. Those of us who in our childhood climbed great hills or walked long distances to school, find our children objecting to walks of half the distance, and thinking it a hardship if

they are not transported by horse power or machinery. The multiplication of conveniences of travel and mechanical substitutes for labor makes physical degeneracy easy and physical labor uncongenial to us and our children. Physical apathy is as much a vice to be shunned as those vicious indulgences of appetites that deprave organism and rob it of vital stamina. We need not seek to emulate Hercules or Heenan but we cannot have the highest capacity of brain-power associated in an absolutely incapable muscular system. The muscular system must be exercised, in every scheme of education, so at least as not to lose its capacity. The energetic man or woman who spends a reasonable time out of doors and ignores the too habitual and exclusive use of carriage, street car and elevator, will receive muscular exercise enough to maintain health, if the proper balance of physical and mental exertion has been maintained in the developing period of childhood, youth and early manhood or womanhood.

Dr. Hertel, health officer of Copenhagen, in his instructive studies of the sanitary condition of the school children of Denmark, found among a class of children well fed, clothed and housed from inclemency of weather, the following state of facts: His inquiries were begun at the close of the summer holidays, after the children had been well rested from the pressure of the preceding school term. During the holidays their appetites were generally good, but they lost appetite during the school season. Of 3,141 boys, sixty per cent. he regarded as healthy, thirty per cent. unhealthy. The remainder were not reported to him. On beginning school, seventy-four per cent. of the same boys were healthy, and eighteen per cent. sickly, but before one year's schooling had been given them, the percentage of sickly children had doubled. This is a fearful ratio of increase of ill-health to be set down to Denmark school-life and the seed of a vast harvest of confirmed valetudinarianism to be reaped by these innocents later on in life, when bodily and conse-

quent mental health will be more valuable than minds early matured in the multiplication table or mimicking the really great in a robust knowledge of the *belles lettres*, arts and sciences; when all the educational acquisitions of a life-time would be willingly exchanged for a return of the lost health and vigor. No burden is so great to bear or so cruel to bequeath, as the knowledge which the education gives of the beauties and treasures of learning, if, with the bestowal of her gifts there dawns upon the mind the painful consciousness of physical incapacity to enjoy them and a paralysis of force which makes it impossible for the dissatisfied victim of over mental strain to walk further in the enchanting paths of culture and the flowery fields of true refinement. To be weak here and now is to be miserable indeed. It were better the paradise had never been presented to our view, than that it should only be seen to reveal to us what we might, but now cannot, enjoy. In Copenhagen, Hertel found, that on entering school, one boy in every five was sickly, and after a year's attendance, one boy in three was more or less a physical failure. Suppose this vicious process of education goes on there with those boys' children and their children's children, what will finally be the fate of Denmark if the county schools pattern after, and do equally destructive work with the educational establishments of the city of Copenhagen?

"At a meeting of the Académie de Médecine, in 1887, M. Gustave Lagneau called further attention to the disastrous effects of the (*surmenage intellectuel*), or the intellectual strain, exercised on the youth of to-day, during the ten years they pass in the lycées. The examinations at the *Ecole polytechnique*, *Ecole normale supérieure*, *Ecole centrale*, *Ecole navale*, require such a severe course of studies that the physical reaction is often very serious. MM. Ernest Martin, Béard, Charcot, and Henrot have found a considerable number of students belonging to these establishments affected with myopia, dyspepsia, phthisis, nervous exhaustion, followed in many cases by impaired intelligence. It has become an imperative necessity to recognize that the doubtful intellectual development effected by the present system, detracts from physical aptitudes; the fact that out of a thousand French conscripts, 460 were declared unfit for service, is significant. M. Dujardin-Beaumetz, who is doctor at an école normale of young girls,

stated that a reform in the programme of the studies pursued in girls' schools was equally urgent. The prolonged hours of study, and the severe examinations are equally detrimental to body and mind. M. Dujardin-Beaumetz deplored the tendency of the present day to educate girls as teachers, who were often better fitted for other employments. The competition for the position of school teacher is something incredible. In Paris alone there are 4,171 girls provided with teacher's certificates who are in quest of the position, while only about 100 vacancies for this position occur during the year."—[*Paris correspondent American Lancet*, July, 1887.

The hours of daily work of these Copenhagen school-boys varied from four to ten and a half, and one-third of them received, in addition, private tuition which materially lengthened the average. Some nine-year-old boys worked eleven hours a day. This is shameful. Such of them as may live to adult age, will find the eight-hour system of labor altogether too long for them. The girls' schools made a worse showing. Of 1,200 girls, fifty-three per cent. were healthy, and thirty-nine per cent. sickly, after one year of study, while on entering school only twelve per cent. were sickly, a healthier showing than that of the boys. At sixteen, sixty-one per cent. of girls were sickly; the girls had not time for out-door exercise, is recorded of them on their mothers' authority. What is true of school-girls in Denmark, is true here. Such girls find their way too soon, though unwillingly, to places like Bellefontaine and Calvary, and too soon, though usually less unwillingly, to the matrimonial altar. The facts are strikingly and painfully suggestive. The figures of mental and physical failure found in Denmark, can be more than duplicated in our own land. We are a faster people than the Danes. We have before us a picture of degeneracy in the young of a country whose people are not pressed upon as ours are. If the element of physical stamina necessary to sustain developing brain and mind, are not so strong in us as they were in our ancestors, and English and American as well as European school statistics sustain the fact, what must we do to be saved as a people, and what must we do to save our children? I have pointed out some of the paths

that lead to restoration of that which we have lost and are losing. Shall you pursue them? I know, ladies, from your request for an address on over-pressure from one who has made the mind in its relations to organism almost a life-long study, that your minds have discerned the dangers, and that you are discerning enough to have discovered that our educational methods provide for the exercise and abstraction of mental force while they have too much neglected the building of the brain.

Our chief aim in our present defective methods of teaching and training has been to run the educational machine to our purpose, with little thought of keeping it in repair and increasing its power as well as speed. The remedy lies in looking more wisely after the balance of bodily waste and repair, the construction, reconstruction and substantial development of body and brain. This done well and we and our children may safely endure the increased pressure of the present and over-pressure will become a thing of the past.

Matter and force—physical and psychical, are inseparably united in nature, and what nature has wisely joined together, let us not attempt to put asunder. Though Heaven is our desired destiny, we must not forget that we are of the earth, earthy in our capacities and powers.